

CLAIMS:

1. A process for producing a stable solution containing Anatase titanium oxide intended to be deposited on a substrate in order to obtain a transparent photo-catalytic coating, comprising the steps of:

- preparing an initial stabilized peptized solution including a titanium precursor material, an organic solvent, an acid agent,
- mixing said initial solution with water in such a manner that the molar ratio of water-to-titanium of the obtained intermediate solution is greater than 0.8, the quantity of acid agent in said initial solution being such that the pH of said intermediate solution is less than 3,
- heat treating said intermediate solution at a temperature between 80°C and 270°C,
- dispersing the heat-treated intermediate solution,
- exchanging water by an organic solvent with low surface tension to obtain a final solution,
- dispersing said final solution.

2. The process of Claim 1, wherein said initial peptized solution is notably stabilized by the presence of water in order to obtain a molar ratio of water-to-titanium smaller than 1 in said initial solution.

3. The process of Claim 1 or 2, wherein said initial peptized solution is notably stabilized by aging of said initial solution at room temperature.

4. The process of any one of the Claims 1 to 3, wherein the quantity of acid agents in said initial solution is such that the pH of said intermediate solution is between 1 and 2.

5. The process of any one of the Claims 1 to 4, wherein heat-treating step is carried out by refluxing or by autoclaving.

6. The process of any one of the Claims 1 to 5, wherein heat-treating step is carried out at a temperature lower than 140°C.

7. The process of any one of the Claims 1 to 6, wherein the molar ratio of water-to-titanium of the obtained intermediate solution is greater than 30.

5 8. The process of any one of the Claims 1 to 7, wherein at least one of said dispersion steps is carried out by ultrasonication of the solution.

9. The process of any one of the Claims 1 to 8, characterized in that a re-concentration step is carried out after the exchange step in order to obtain a more concentrated final solution.

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10. A solution obtained by a process according to any one of the claims 1 to 9.

11. A process for coating a substrate with a photo-catalytic and transparent layer, including the step of:

- 15 - preparing a solution according to Claim 10,
- coating the substrate at room temperature with said final solution.

12. The process for coating a substrate according to Claim 11, wherein a mixing step is carried out for mixing the prepared solution with a sol-gel solution of SiO₂ before the coating
20 step.

13. The process for coating a substrate according to one of the Claims 11 and 12, wherein said step of coating is repeated in order to obtain a thicker layer of photo-catalytic material and greater photo-catalytic activity.

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14. Substrate provided with a photo-catalytic and transparent layer, characterized in that said substrate is obtained according to a process as claimed in any one of the Claims 11 to 13.

15. Substrate as claimed in Claim 14, wherein said substrate is of thermally sensitive
30 material.

16. Substrate as claimed in one of the Claims 14 and 15, wherein the substrate is of polymer material.